



Research on the Application of Artificial Intelligence in Smart Logistics in Australia

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Abstract. Supply chain logistics field is an important part of logistics industry. Australia is vast and sparsely populated, and the railway transportation is underdeveloped, which can only meet the needs of mineral transportation. Highway traffic has become the main mode of transportation, in order to achieve high efficiency. However, with the comprehensive popularization of artificial intelligence (AI) technology, the traditional supply chain logistics field has been unable to meet the needs of society, resulting in reduced industrial operation efficiency. This paper analyzes the development trend of logistics industry under the background of AI in the future, expounds the application of smart logistics in Australia, and then explores the application path and challenges of AI in Australia. In order to promote the transformation and innovation of supply chain logistics in Australia, it is necessary to form a correct understanding of AI and make scientific use of this technology, so as to improve the intelligence level of supply chain logistics in Australia.

Keywords: Supply chain logistics · Artificial intelligence · Intelligent · Transformation and upgrading

1 Introduction

Australia is a maritime island country with a territorial area of 7.68 million square kilometers, which is not much different from China, but similar in logistics spatial layout and regional organization. With a population of 25 million, the land is vast and sparsely populated, and the market demand of logistics trade is far from that of China [1]. The logistics industry in Australia started in the 1950s. At first, it started with distribution. Later, basic businesses such as air transportation and warehousing were the mainstay. The proportion of transportation and warehousing expenditure in Australia's GDP was about 5% [2]. In AI, through the open source of related algorithms and the characteristics of big data internet, it can embody brand-new solutions, complete standardization and high efficiency in the whole supply chain logistics, and become a brand-new development source [3]. In order to promote the transformation and innovation of supply chain logistics in Australia, improve the efficiency of industrial operation and meet the needs of social development in Australia, it is necessary to form a correct understanding of AI, so as to make scientific use of this technology, dig deep into its core value, and then improve the intelligent level of supply chain logistics in Australia [4, 5].

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Australia is vast and sparsely populated, and the railway transportation is underdeveloped, which can only meet the needs of mineral transportation. And highway traffic has become the main mode of transportation, in order to be efficient [6]. At present, the key elements of the growth of AI industry have matured, and the innovative achievements in perception, cognition and action have gone from laboratory to industrialization [7]. The growth of emerging technologies needs a scene landing process [8]. In the real economy environment, manufacturing and logistics industries are the best scenarios for AI development. This paper analyzes the development trend of logistics industry under the background of AI in the future, expounds the application of smart logistics in Australia, and then explores the application path and challenges of AI in Australia.

2 Overview of AI and Smart Logistics

2.1 Ai

AI is widely used in various fields of social development, such as education, medical care, health, old-age care, transportation, etc. It is profoundly changing the service mode in various fields of society and promoting the innovation of service mode. AI has already lit up the life of a smart society [9]. Smart products are based on unmanned driving, face recognition, etc., and various facilities and equipment developed according to AI. Logistics industry is a compound service industry that integrates transportation, warehousing, freight forwarding, information and other industries, and it is a basic and strategic industry that supports the growth of national economy. For any enterprise, if it wants to transform, it will face great pressure, but opportunities often coexist with challenges. Only by facing the challenges directly and seizing the opportunities can enterprises bring about changes for themselves. The reason why “AI + logistics” is quickly accepted by the logistics industry is mainly because AI helps to quickly reduce the cost of logistics in Australia and improve the efficiency of logistics. Smart logistics is not to overthrow the original traditional logistics, but to improve the work efficiency and quality of the logistics industry, reduce logistics costs and innovate constantly through some technical means such as AI. The multi-dimensional collaborative classification of logistics based on AI is shown in Fig. 1.

2.2 Smart Logistics

In the past, the main business of supply chain logistics mode was product sales and transportation, and the supply chain logistics was unitary and could not guarantee its integrity. After determining the freight rate of finished products, the most suitable shipper is selected. The essence of smart logistics and logistics is the process of making goods flow from the supplier to the receiver. Smart logistics is characterized by relying on the Internet, widely applying new generation information technologies and equipment such as big data and AI, improving the ability of thinking, perception, learning, analysis, decision-making and intelligent execution of logistics system, and improving the intelligence and automation level of the whole logistics system and process control through fine, dynamic and scientific management. In the transformation of supply chain

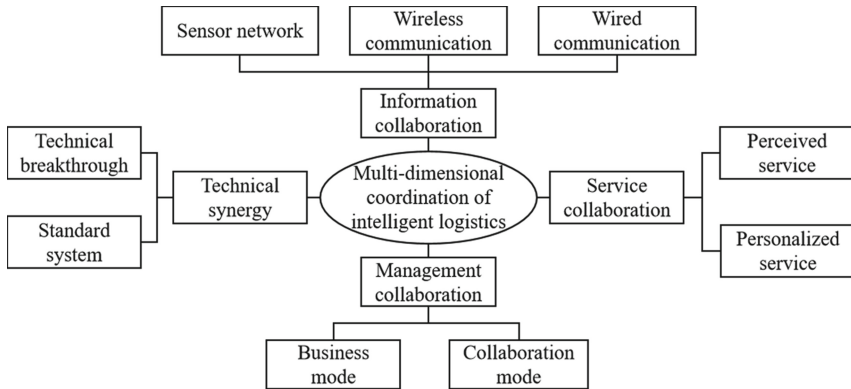


Fig. 1. Multi-dimensional collaboration classification of logistics

logistics AI, in order to achieve the effect of satisfying customers, in addition to reducing production costs and inventory, it is also necessary to solve the problem of vehicle transportation, realize a small number of multi-frequency and efficient transportation, and reduce logistics LTL. In addition to standing from the customer’s perspective, we will carry out technological innovation on the basis of the original supply chain logistics service, create value by virtue of many advantages of AI, and make all customers feel that people-oriented service is carried out to meet their interests and needs.

3 Application of Smart Logistics in Australia

3.1 Smart Logistics Promotes Australia’s Economy

Theoretically, logistics should be the most resource-sharing industry. Repeated investment in industry and repeated construction of logistics facilities will directly lead to overcapacity and waste of resources in Australian logistics enterprises, and then increase logistics costs. Therefore, improving the sharing degree of logistics resources as soon as possible is an important problem to be solved urgently in the Australian logistics industry. The logistics outsourcing of Australian production enterprises is relatively high, and most production enterprises focus on the core production links and hand over the logistics links of products to logistics enterprises. With the continuous growth of economic globalization and e-commerce, the future economic development will inevitably develop in the direction of sharing economy. Only by adhering to the rational use of resources and integrating and sharing resources can Australian logistics continue to develop and progress.

3.2 Problems Faced by Smart Logistics in Australia

During the period from the starting point warehouse to the final warehouse of logistics transportation, it is inevitable that there will be problems in connection, resulting in the loss of transported materials. However, the materials will be transported from the dedicated line storage point to the designated dedicated line point after being transported

out of the warehouse, during which many logistics enterprises may be responsible for the transportation, and there may also be problems in connection between transportation links. Therefore, the supply chain logistics should carry out AI construction and innovation, and reduce the intermediate logistics links as much as possible, so as to make the supply chain logistics transportation more efficient and ensure the accuracy, so as to avoid the damage of materials in transit.

4 Application of AI in Smart Logistics

4.1 AI Promotes the Growth of Smart Logistics

Australia is vast and sparsely populated, and the railway transportation is underdeveloped, which can only meet the needs of mineral transportation. Highway traffic has become the main mode of transportation, in order to achieve high efficiency. Due to Australia's vast territory and high labor costs, most logistics companies widely use advanced automation technology to reduce costs and improve efficiency, and many operations of logistics companies have basically realized the automation of the whole operation process. In the application research and construction of roads, Australia respects nature, and the roads rise and fall with the hills. Except for the overpass at the intersection of several high-speed main roads, they all use intersection plane traffic. The advantage of AI is that it can integrate different data sources in the supply chain logistics system, and complete the integration of distributed systems according to the staged data of the data link. In the IT system, enterprise suppliers can also form a complete data chain according to the resource plan or the saved data information in the suppliers.

4.2 The Problems Faced by AI in the Application of Smart Logistics

Due to the lack of a perfect logistics standard system, even though some enterprises have established smart logistics systems, there are still isolated islands, making it difficult for different enterprises to exchange data and share information. The trained talents still cannot fill the gap of talents in logistics industry. However, enterprises urgently need high-end intelligent talents who can understand both theory and operation, and have both technology and management, which restricts the development process of smart logistics to some extent. The healthy growth of smart logistics requires the establishment of a scientific and systematic logistics operation system and effective logistics management methods, which are inseparable from professional high-end logistics talents. But at present, whether it is society or individuals, the understanding of logistics is more at the simple level of express delivery. Many colleges and universities don't offer logistics management majors, and enterprises need to invest a lot of energy to train a professional logistics talent on their own. This leads to the supply of high-end logistics talents in Australia is far less than the demand of enterprises.

5 Application and Challenges of AI in Australian Smart Logistics

The emergence of smart logistics means that the current logistics facilities in Australia can no longer meet the growing logistics demand. If the storage area of the enterprise is reduced, it is necessary to reduce the management cost and adopt the zero inventory

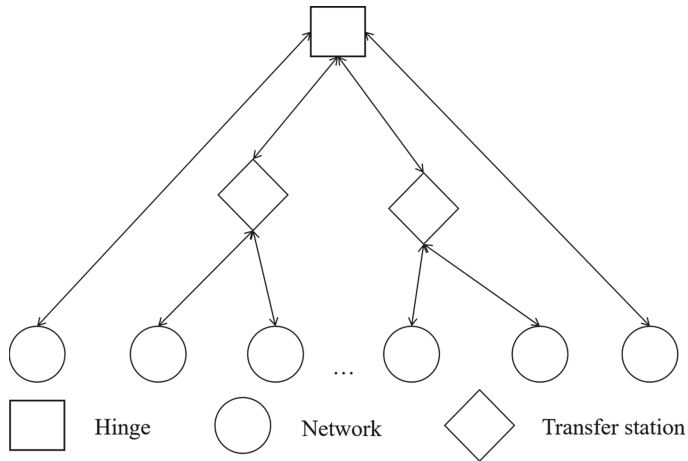


Fig. 2. Regional network structure of logistics hub

management method. Although the unit price of a single purchase will exceed the centralized purchase price in batches, considering that large-scale transportation will reduce the quotation, the principle cost of multi-batch and small batch can still ensure the ideal effect. The regional network structure of logistics hub is shown in Fig. 2.

When the supply chain logistics and AI are fully integrated, comprehensive analysis is carried out by using big data according to the geographical location of manufacturers and suppliers, actual operating costs, warehouse construction and many other elements, so as to avoid the influence of subjective factors on site selection, and to optimize the final site selection results according to long-term strategic planning. After the realization of intelligent warehousing, the goods storage management gradually has the characteristics of containerization and automation. The container of goods storage and transportation applies AI, and all goods can be transported point-to-point by pallet. Reducing intermediate processes during transportation also improves the material turnover rate.

6 Conclusions

With the rapid growth of AI, the logistics industry is undergoing a new round of changes. Generally speaking, the transition from traditional logistics to smart logistics is an inevitable trend of the growth of Australian logistics industry. In order to achieve sustainable development, logistics enterprises must combine today's developed AI. Intelligent development is the inevitable trend of the future growth of supply chain logistics, which can significantly improve the efficiency of industrial operation, reduce costs and meet the needs of the times. For supply chain logistics enterprises, we should conform to the development trend of intelligence in all walks of life, vigorously promote the transformation of logistics infrastructure and production tools to intelligence, realize the construction of supply chain logistics operation process in the direction of intelligence, realize the sharing of supply chain resources, improve system standards and increase the

training of AI professionals, so as to promote the mutual integration and coordinated growth of AI and supply chain logistics.

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